appliance saturation survey

1981

ENERGIE NB POWER

APPLIANCE SATURATION SURVEY

1981

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

PREPARED BY:
FORECAST SECTION/
STRATEGIC DEVELOPMENT

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FOREWORD

The results from the seventh Appliance Saturation Survey conducted by The New Brunswick Electric Power Commission are presented in this report. This mail survey was conducted during November and December 1981.

This report differs in format from the previous six as the principal statistics are shown for the four main regions (referred to as Branches) instead of the fifteen administrative districts of the N.B. Power System. This change is designed to enhance the readability of the report without affecting its information content. Computer printouts of the tabulations by districts can be made available for those who may need the details.

The survey was designed primarily to meet the information needs of the forecasting section of the Strategic Development Group. Areas of particular interest to our forecasters included the saturation levels (percentage ownership or use) of major household electrical appliances and equipment, the consumption characteristics of different households and customer intentions regarding choice of future space heating fuels. It is hoped that the information will also be useful in other areas of the Commission's operations and to the electrical industry in New Brunswick.

Our thanks to the many people who contributed to the collection, compilation and analysis of the survey data. Special thanks are due to the participating customers who took the time to answer our questions.

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GENERAL

SECTION I

SURVEY METHODOLOGY

The results of the survey are based on 7612 processable responses received from approximately 20,000 questionnaires mailed to N.B. Power's residential customers. The random sample was designed to exclude seasonal customers.

The 38% response rate is down from the 67% rate in the 1979 survey, because the second (reminder) mailing was not done in this survey. However the total number of responses is only slightly below the nearly 8000 responses received in 1979. Second mailing was eliminated in the 1981 survey by increasing the size of the initial sample to 20,000 as compared to 12,000 in the previous survey. This change in method is not expected to result in any bias since the analysis of the 1979 data had indicated negligible difference in responses from the first and second mailing. Avoidance of second mailing resulted in lower total "out of pocket" cost, lesser administrative efforts and a shorter time span over which the survey was conducted.

The sample size, its distribution by region and a comparison to the corresponding total population, i.e. residential customers in NB Power service territory, is shown in Appendix A. The four administrative regions (Branches) are shown in the provincial map in Appendix B.

The 1981 questionnaire design (Appendix C) allows a direct comparison of the saturation levels of major appliances with the findings from the previous surveys. Responses to Q.36, and Q.60 to 63, in this survey, are not shown in this report due to inconsistency resulting from printing inaccuracies. General questions and those related to customer home are somewhat different from previous surveys reflecting the current information needs.

The customer responses were keyed into a computer readable format. Responses on each questionnaire were keyed twice and data was considered acceptable only if both attempts produced exactly identical results. Editing and analysis of the data was done by computer programs especially developed for this purpose by the Computer Services Division of the Administration Group. The workflow for the survey is illustrated in Appendix D.

PRINCIPAL FINDINGS

The principal findings of the November 1981 survey are summarized below and the saturation statistics for major appliances are compared with previous surveys in Table I to III. The changing trend in the saturation levels is shown in Figures I and II which follow the tables in this section.

1. The electrical appliance saturation levels (except B & W television and plug in space heaters), within the households surveyed, have increased in comparison to the 1979 results (pages 5, 7). The increases are in line with historical patterns and projections.

2. Electricity as a principal space heating source has grown from 22.8% in 1979 to 23.9% in 1981. Another 9.3% of the residential customers indicated the use of electricity as a supplementary heating source in the 1981 survey. The corresponding percentage from 1979 survey is 9.0% (page 6).

3. Utilization of wood as a principal space heating fuel continues to increase. The 19.7% saturation level as principal heating fuel compares to 12.2% in 1979 (page 6). The survey results also indicate that 43.6% of the electric heated homes and 22.2% oil heated homes use wood as a supplementary space heating fuel (page 19).

4. Electric Water Heater saturation level has increased from 64.8% in 1979 to 66.1% in 1981 (page 7).

5. In response to the question on planned changes in the principal space heating system 68.4% indicated no plans to change, 5.9% plan a change within one year, 7.2% within five years and 18.3% did not know when they would change (page 15).

6. Of those planning a change in heating system about 40% indicated the use of electricity by itself or in combination with other fuels. Over 50% of respondents indicated their preference for wood or its combination with another fuel. Natural gas, solar, oil, their combination with each other or other heating sources were the other choices indicated by respondents (page 15).

7. Cost consideration was given as the principal reason for planned change of heating fuel by 63% of respondents while need for replacement (12.9%) and federal government grant for off-oil conversions (8.6%) were given as other main reasons (page 15).

8. Electricity by itself or in combination with wood or another fuel would be the choice of over one half of the respondents if they were to build a <u>new</u> home today (page 16).

9. If natural gas was available then 19.2% of the respondents indicated their willingness to switch to it, 34.7% indicated unwillingness to switch and the remainder did not know what they would do (page 16).

10. Oil is considered as the most expensive heating fuel today by 59.3% of the respondents and electricity was thought to be most expensive by 35.3%. Wood is currently perceived as the cheapest heating fuel by 78.4%, electricity by 10% and oil by 4% of those responding (page 17).

11. Three out of four (74.9%) of the respondents think that oil would be the most expensive heating fuel in five years and 21.6% picked electricity. Wood is indicated to be least expensive in five years by 73.2% and electricity by 19.1% of the respondents (page 17).

TABLE I

COMPARISON WITH PREVIOUS SURVEYS

SATURATION SURVEY RESULTS FROM

1968, 1970, 1972, 1976, 1979, 1981

	Percent (%) Saturation Levels					
	1968	1970	1972	1976	1979	1981
Cooking						
Electric Range	44.9	54.9	65.7	78.2	85.7	89.1
Oil Range	18.3	16.8	13.9	8.9	3.0	1.9
Wood Range	24.1	14.6	10.2	6.6	3.9	3.1
Gas Range	8.6	8.5	8.5	6.3	4.8	3.9
Other/None	4.1	5.2	1.7	0.0	2.6	2.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Refrigerator-Freezer						
Combination Refrigerator-Freezer	17.0	17.8	19.2	21.7	45.3	63.7
Other Electric Refrigerator	77.4	78.7	79.0	76.9	52.5	38.4
Frost Free Refrigerator (combination or Other)	-	-	-	-	63.8	62.5
No Refrigerator	5.9	4.0	2.9	1.0	2.1	-
Separate Home-Food Freezer	26.7	31.5	35.8	46.7	53.9	58.6
Laundry						
Wringer or Spin Washer	59.3	57.0	49.0	36.9	20.6	16.7
Automatic Washer	30.0	35.3	44.1	58.4	71.3	75.0
Combination Washer Dryer	-	-	-	-	-	2.5
Electric Dryer	29.6	49.3	56.7	67.9	70.4	71.9

TABLE II

SATURATION SURVEY RESULTS FROM

1968, 1970, 1972, 1976, 1979, 1981

	Percent (%) Saturation Levels					
	1968	1970	1972	1976	1979	1981
Principal Space Heating Fuel						
Oil	73.9	81.1	85.3	78.6	62.6*	55.4
Wood	22.9	14.6	7.8	6.5	12.2*	19.7
Electric	1.1	2.8	5.8	14.9	22.8	23.9
Other	2.1	1.5	1.1	-	2.4	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Supplementary Space Heating Fuel**						
Oil	-	-	-	-	3.7	6.7
Wood	-	-	-	-	30.7	22.7
Electric	-	-	-	-	9.0	9.3
Other/None	-	-	-	-	56.6	61.3

* The 9.6% of the respondents, who indicated their principal heating fuel to be combination oil/wood in the 1979 survey, have been allocated to oil and wood categories separately on the basis of their responses to a question related to supplementary heating fuel.

** Data has been adjusted to exclude customers indicating the same principal and supplementary heating fuel.

TABLE III

SATURATION SURVEY RESULTS FROM

1968, 1970, 1972, 1976, 1979, 1981

	Percent (%) Saturation Levels					
	1968	1970	1972	1976	1979	1981
Water Heating Fuel						
Oil	23.5	33.4	29.0	29.8	27.9	27.5
Electric	16.8	22.5	39.7	51.9	64.8	66.1
Propane	-	-	-	-	3.0	2.4
Other or None	59.7	44.1	31.3	18.3	4.3	4.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Other Appliances						
Dishwasher	2.9	4.9	7.1	12.6	22.1	27.3
Toaster Oven	-	-	-	-	23.4	24.6
Microwave Oven	-	-	-	-	3.5	6.4
Color T.V.	-	9.0	20.9	55.6	74.6	81.0
B. & W. T.V.	104.5	109.7	98.3	74.5	44.1	40.7
Hi-Fi or Stereo	35.8	43.0	49.6	67.1	61.7	67.7
Air Conditioner	2.8	4.2	5.6	7.5	5.8	6.5*
Plug in Humidifiers	-	-	-	-	17.0	18.6
Plug in Dehumidifiers	-	-	-	-	13.3	19.4
Plug in Space Heaters	13.9	16.5	20.2	22.2	8.0	6.7
Car Block Heater	-	-	-	-	32.8	36.3

* Includes central air conditioning

TRENDS IN OWNERSHIP OF SELECTED APPLIANCES

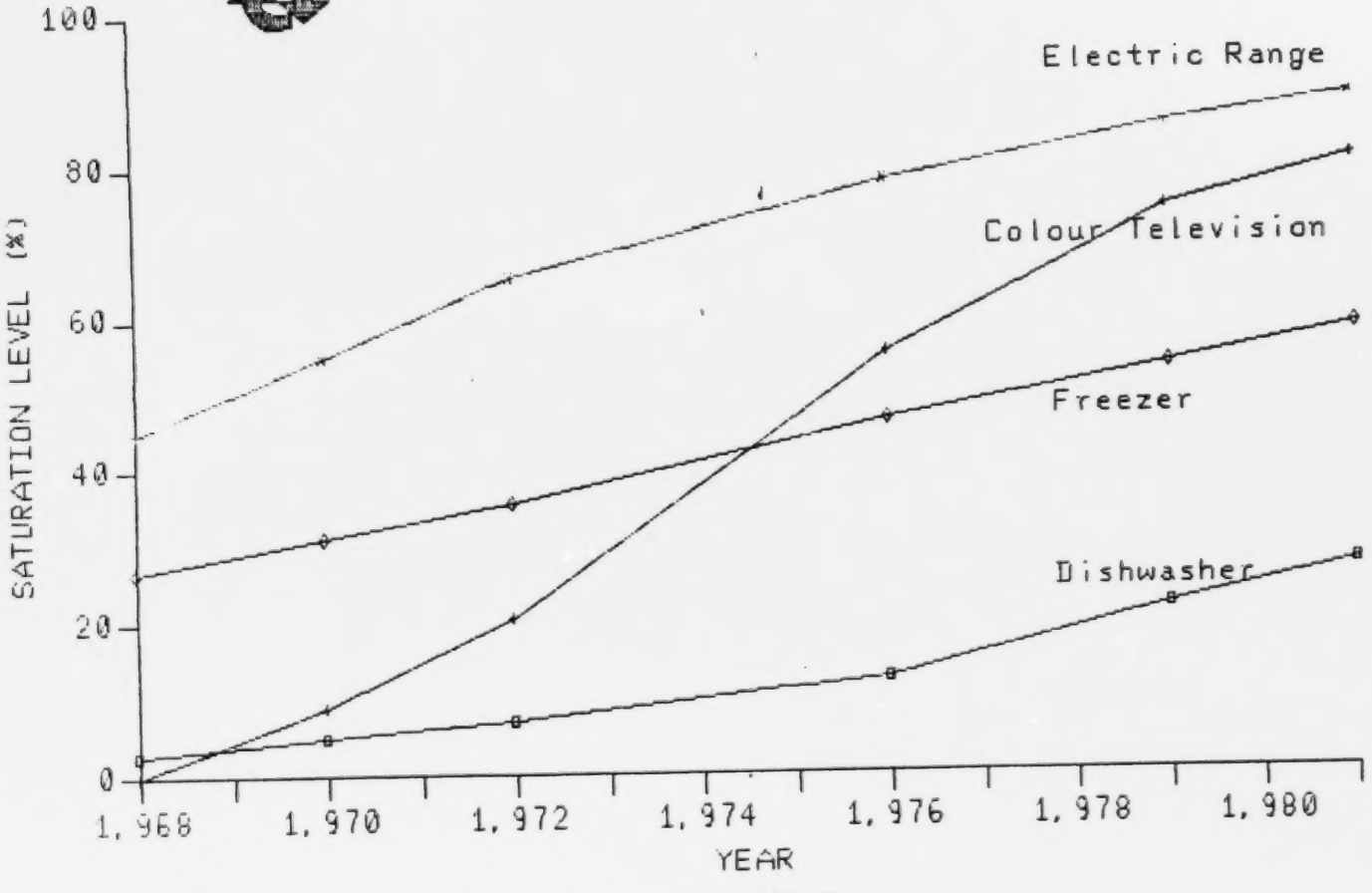


FIGURE I

TRENDS IN OWNERSHIP OF SELECTED APPLIANCES

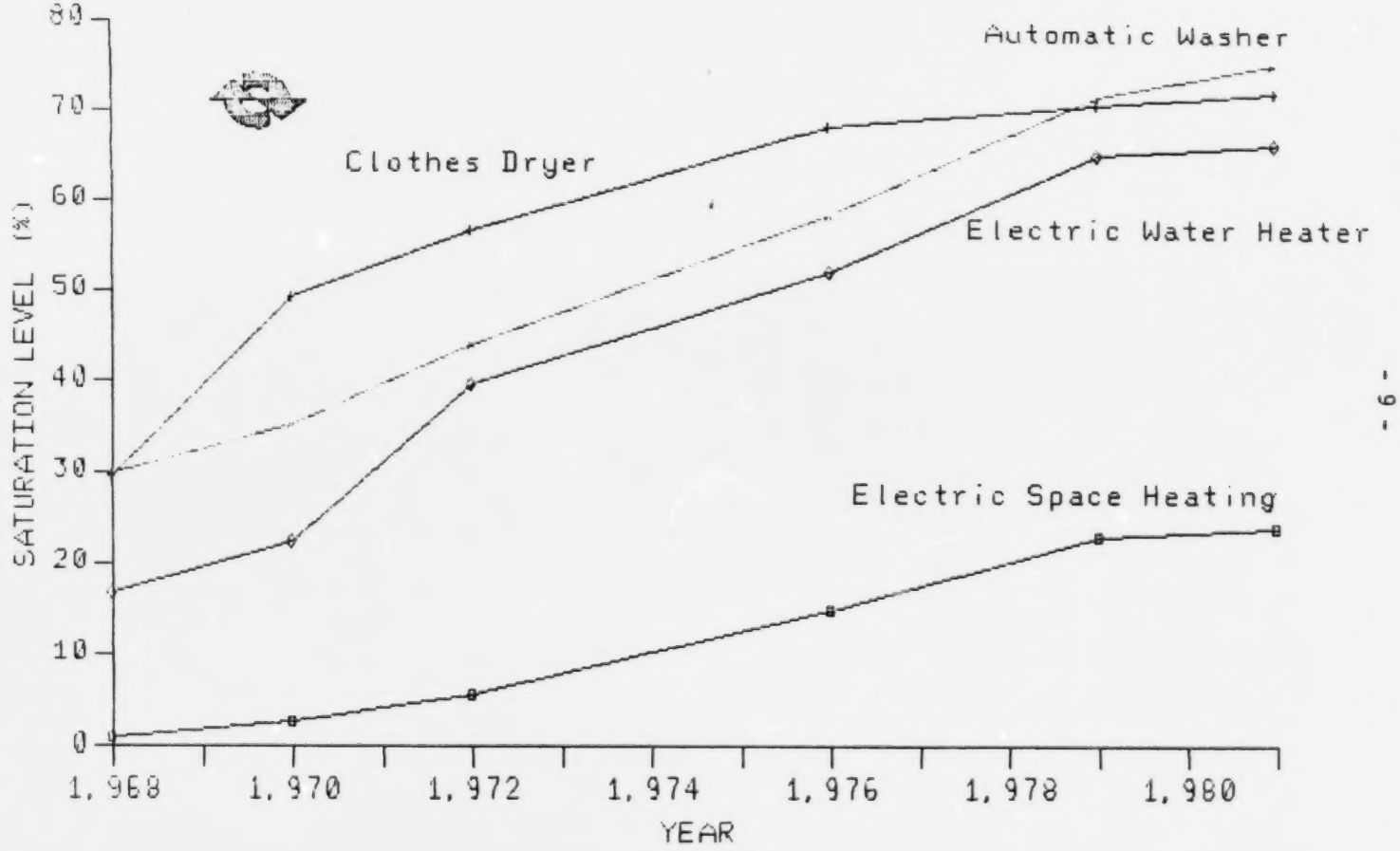


FIGURE II

REGIONAL AND OVERALL N.B. POWER STATISTICS

SECTION II

KITCHEN APPLIANCES

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
COOKING	Percent	Percent	Percent	Percent	Percent
Electric Range (Continuous Clean)	12.6	11.7	9.3	10.2	11.1
Electric Range (Self Clean)	10.2	12.6	12.2	11.3	11.5
Electric Range (No Cleaning Feature)	65.4	67.1	62.1	69.5	66.5
Total Electric	88.2	91.4	83.6	91.0	89.1
Oil Range	2.3	1.7	3.3	1.1	1.9
Gas Range	3.6	3.2	5.7	3.5	3.9
Wood Range	3.5	2.1	4.8	2.7	3.1
Other	2.4	1.6	2.6	1.7	2.0
TOTAL	100.0	100.0	100.0	100.0	100.0
REFRIGERATION					
Refrigerator (Frost Free)	50.4	67.5	59.6	61.3	62.4
Refrigerator (Manual Defrost)	39.3	37.0	46.9	38.4	39.7
TOTAL	99.7	104.5	106.5	99.7	102.1
Freezer (Frost Free)	8.9	10.5	7.4	9.1	9.1
Freezer (Manual Defrost)	45.1	48.4	56.8	50.2	49.5
No Freezer	46.0	41.1	35.8	40.7	41.4
TOTAL	100.0	100.0	100.0	100.0	100.0

LAUNDRY APPLIANCES

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
WASHERS	Percent	Percent	Percent	Percent	Percent
Automatic Washer	75.2	77.1	69.6	75.9	75.0
Other Electric Washer (Wringer,spin dry etc)	17.5	12.6	22.4	16.4	16.7
Combination Washer/ Dryer (one unit)	3.3	1.8	2.3	2.5	2.5
No Washer	4.0	8.5	5.7	5.2	5.8
TOTAL	100.0	100.0	100.0	100.0	100.0
DRYER					
Electric Clothes Dryer	70.1	70.4	72.5	74.5	71.9
Gas Clothes Dryer	0.9	1.0	1.2	0.9	1.0
Combination Washer/ Dryer (one unit)	3.3	1.8	2.3	2.5	2.5
No Dryer	25.7	26.8	24.0	22.1	24.6
TOTAL	100.0	100.0	100.0	100.0	100.0

HEATING FUELS

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
PRINCIPAL SPACE HEATING FUEL	Percent	Percent	Percent	Percent	Percent
Oil	51.6	63.6	54.2	52.3	55.4
Wood	21.0	16.0	21.0	21.0	19.7
Electricity	26.8	19.1	23.9	25.6	23.9
Other/Don't Know	0.6	1.3	0.8	1.1	1.0
TOTAL	100.0	100.0	100.0	100.0	100.0
SUPPLEMENTARY SPACE HEATING FUEL					
Oil	9.2	7.3	8.8	8.7	8.5
Wood	26.5	21.2	27.9	24.4	24.7
Electricity	8.2	10.2	11.4	10.9	10.1
Other/None	56.1	61.3	51.9	56.0	56.7
TOTAL	100.0	100.0	100.0	100.0	100.0
WATER HEATING FUEL					
Oil	24.2	38.7	21.2	24.4	27.5
PROPANE	1.8	2.7	2.9	2.3	2.4
ELECTRICITY	69.5	55.3	71.5	69.3	66.1
OTHER/NONE	4.5	3.3	4.4	3.9	4.0
TOTAL	100.0	100.0	100.0	100.0	100.0

OTHER ELECTRIC APPLIANCES

REGION

ELECTRICAL APPLIANCES	NORTHERN BRANCH	EASTERN BRANCH	SOURTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
	Percent	Percent	Percent	Percent	Percent
Central Air Conditioning	0.9	0.7	0.6	1.4	1.0
Dishwasher	21.6	29.5	27.6	30.0	27.3
Toaster Oven	24.3	25.1	21.8	26.0	24.6
Microwave Oven	4.6	6.8	7.2	7.2	6.4
Color T.V.	81.5	83.9	77.8	80.0	81.0
B&W T.V.	38.1	42.7	43.1	39.9	40.7
Hi-Fi or Stereo	62.9	72.9	66.8	67.8	67.7
Window Air Conditioner	3.9	4.4	3.6	9.0	5.5
Plug-in Humidifiers	11.3	27.1	15.7	19.3	18.6
Plug-in Dehumidifiers	15.9	21.3	22.7	19.0	19.4
Plug-in Space Heaters	5.3	7.3	7.5	6.9	6.7
Car Block Heater	31.6	33.3	31.4	45.5	36.3
Electric Blankets	6.8	14.6	21.1	16.3	14.2

DWELLING CHARACTERISTICS

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
DWELLING TYPE	Percent	Percent	Percent	Percent	Percent
Single Family	82.6	79.4	85.4	79.6	81.3
Duplex	5.3	7.2	2.5	5.0	5.2
Apartment	5.7	9.2	4.6	9.3	7.7
Mobile Home	6.2	4.0	7.4	6.0	5.8
Total	100.0	100.0	100.0	100.0	100.0
TENURE					
Own	88.8	85.6	92.2	84.5	87.2
Rent	11.1	14.3	7.7	15.4	12.7
Total	100.0	100.0	100.0	100.0	100.0
NUMBER OF ROOMS					
Six or Less	54.1	55.0	52.2	56.7	54.8
Seven	18.0	17.2	18.8	17.1	17.7
Eight	12.5	13.9	14.3	12.7	13.3
Nine or More	15.2	13.6	14.5	13.3	14.0
Total	100.0	100.0	100.0	100.0	100.0
NO. OF PERSONS LIVING REGULARLY					
One	8.7	9.1	11.0	10.3	9.7
Two	24.7	28.7	34.4	30.1	29.1
Three	19.3	20.3	16.6	20.5	19.5
Four	25.2	24.2	21.8	22.2	23.4
Five or More	22.1	17.7	16.2	16.9	18.4
YEAR DWELLING BUILT					
Before 1956	35.8	36.4	44.7	34.7	37.1
1956-1960	5.0	6.4	3.3	5.8	5.5
1961-1965	6.6	6.4	4.5	8.3	6.7
1966-1970	7.9	7.1	6.1	8.1	7.4
1971-1975	19.2	18.9	17.1	17.2	18.1
1976-1981	19.8	17.2	19.9	18.5	18.7
Do Not Know	5.7	7.8	4.4	7.4	6.7
Total	100.0	100.0	100.0	100.0	100.0

HEATING SYSTEMS

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
AGE OF PRINCIPAL SPACE HEATING SYSTEM	Percent	Percent	Percent	Percent	Percent
0-5 years	39.2	33.4	37.7	37.3	36.9
6-10 years	24.4	23.7	23.9	22.4	23.5
11-15 years	13.6	14.0	13.3	14.2	13.8
Over 15 years	14.4	18.1	17.0	15.2	16.1
Do Not Know	8.1	10.6	7.8	10.6	9.5
TOTAL	100.0	100.0	100.0	100.0	100.0
PLANS TO CHANGE HEATING METHOD					
No Change	69.3	66.3	70.0	68.4	68.4
Within the Year	6.9	5.4	5.4	5.7	5.9
Within Five Years	5.0	8.3	8.2	7.6	7.2
Do Not Know	18.6	19.7	16.2	18.1	18.5
TOTAL	100.0	100.0	100.0	100.0	100.0
FUEL FOR PLANNED NEW HEATING SYSTEM					
Oil	1.1	0.7	1.5	0.1	0.8
Wood	30.3	20.5	25.4	27.4	25.9
Electricity	19.8	19.2	17.3	20.4	19.4
Natural Gas	9.2	16.8	9.6	10.6	11.8
Solar	2.5	2.0	0.9	1.5	1.8
Electric/Oil	1.1	0.5	0.9	1.0	0.9
Electric/Wood	14.2	10.2	13.3	15.0	13.2
Electric/N. Gas	1.7	5.1	2.1	3.0	3.1
Oil/Wood	11.7	11.9	11.1	8.9	10.8
Wood/N. Gas	3.0	3.1	3.7	3.2	3.2
Others	5.4	10.0	14.2	8.9	9.1
TOTAL	100.0	100.0	100.0	100.0	100.0
REASON FOR PLANNED CHANGE OF HEATING FUEL					
COSP Grant	10.9	7.6	7.8	7.9	8.6
Need Replacement	10.9	14.3	11.4	14.3	12.9
Cost	62.2	66.7	61.3	60.7	63.0
Convenience	5.3	4.4	7.5	6.4	5.6
Comfort	6.0	3.3	4.8	5.2	4.8
Other	4.5	3.4	6.9	5.1	4.8
TOTAL	100.0	100.0	100.0	100.0	100.0

GENERAL ENERGY
RELATED QUESTIONS

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
CHOICE OF HEATING FUEL FOR NEW HOME	Percent	Percent	Percent	Percent	Percent
Oil	3.0	4.3	2.5	2.5	3.1
Wood	13.4	7.6	11.6	11.7	11.1
Electricity	19.1	17.5	18.2	16.7	17.8
Propane	0.9	2.6	2.1	1.3	1.7
Solar	1.6	2.1	1.9	2.2	2.0
Oil/Wood	13.5	14.8	9.5	10.9	12.4
Wood/Electricity	34.9	28.0	34.8	35.3	33.2
Others	13.6	23.1	19.4	19.4	18.8
TOTAL	100.0	100.0	100.0	100.0	100.0
TYPE OF SYSTEM IF NEW HOME FUEL IS ELECTRICITY					
Baseboard	68.5	60.1	71.4	65.0	65.7
Electric Furnace	20.2	22.0	18.2	19.0	20.0
Radiant Cable	3.2	2.7	1.0	2.6	2.5
Heat Pump	3.6	11.7	5.5	9.6	8.0
Plug in Heaters	1.0	1.1	1.3	0.7	1.0
Other	3.2	2.2	2.1	2.8	2.6
Total	100.0	100.0	100.0	100.0	100.0
SWITCH TO NATURAL GAS IF AVAILABLE					
YES	16.3	23.8	18.4	18.1	19.2
NO	26.4	30.0	38.0	35.4	34.7
Do Not Know	47.1	46.0	43.5	46.4	46.0
TOTAL	100.0	100.0	100.0	100.0	100.0

GENERAL ENERGY RELATED QUESTIONS

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	N.B. POWER TOTAL
MOST EXPENSIVE FUEL TODAY	Percent	Percent	Percent	Percent	Percent
Oil	55.5	57.8	66.2	59.9	59.3
Electricity	39.0	37.7	28.4	33.7	35.2
Wood	3.0	1.7	2.7	4.0	2.9
Propane	2.3	2.5	2.5	2.2	2.4
TOTAL	100.0	100.0	100.0	100.0	100.0
LEAST EXPENSIVE FUEL TODAY					
Oil	2.5	5.6	3.7	4.2	4.0
Electricity	8.9	11.6	12.3	8.2	10.0
Wood	83.7	73.1	76.4	79.5	78.4
Propane	4.7	9.5	7.4	7.8	7.4
TOTAL	100.0	100.0	100.0	100.0	100.0
MOST EXPENSIVE FUEL 5 YEARS FROM NOW					
Oil	71.7	76.2	78.7	74.4	74.9
Electricity	24.7	20.4	18.6	21.7	21.6
Wood	2.8	2.5	1.3	3.1	2.3
Propane	0.7	0.7	1.1	0.6	0.7
TOTAL	100.0	100.0	100.0	100.0	100.0
LEAST EXPENSIVE FUEL 5 YEARS FROM NOW					
Oil	2.5	2.6	1.8	1.7	2.2
Electricity	15.3	22.5	22.6	17.5	19.1
Wood	77.8	67.3	70.4	75.8	73.2
Propane	4.2	7.4	5.0	4.7	5.3
TOTAL	100.0	100.0	100.0	100.0	100.0

SELECTED CROSS TABULATIONS

SECTION III

SATURATION LEVEL OF MAJOR ELECTRIC APPLIANCES BY PRINCIPAL SPACE HEATING FUEL

	PRINCIPAL SPACE HEATING FUEL		
	OIL	WOOD	ELECTRICITY
KITCHEN APPLIANCES	Percent	Percent	Percent
Electric Range (All types)	89.1	79.6	97.1
Refrigerator (Frost Free)	61.9	55.7	71.0
Refrigerator (Manual defrost)	41.5	42.5	31.3
Freezer (Frost Free)	8.3	8.3	12.4
Freezer (Manual defrost)	48.7	60.4	44.0
LAUNDRY APPLIANCES	Percent	Percent	Percent
Automatic Washer	74.7	73.6	79.8
Other Electrical Washer	17.7	22.4	9.3
Washer-Dryer (1 Unit)	2.7	1.8	2.2
Electric Dryer	71.3	71.5	76.8

SATURATION LEVEL OF HEATING FUELS
BY PRINCIPAL SPACE HEATING FUEL

	PRINCIPAL SPACE HEATING FUEL		
	OIL	WOOD	ELECTRICITY
SUPPLEMENTARY SPACE HEATING FUEL	Percent	Percent	Percent
Oil	0.0	31.9	1.6
Wood	22.2	0.0	43.6
Electricity	8.3	23.5	0.0
WATER HEATING FUEL			
Oil	42.9	15.5	1.7
Propane	2.3	3.1	1.2
Electricity	52.8	69.4	95.5
Other or None	2.1	11.6	1.6

SATURATION LEVEL OF OTHER ELECTRIC
APPLIANCES BY PRINCIPAL SPACE HEATING FUEL

ELECTRICAL APPLIANCES	PRINCIPAL SPACE HEATING FUEL		
	OIL	WOOD	ELECTRICITY
	Percent	Percent	Percent
Central Air - Conditioning	0.8	0.3	1.3
Automatic Dishwasher	24.5	23.5	37.8
Toaster Oven	26.7	18.3	24.9
Microwave Oven	6.2	5.2	7.9
Colour TV's	81.9	75.0	85.9
B & W TV's	40.2	42.1	40.7
Hi-Fi Or Stereo Systems	65.3	65.7	75.6
Window Air Conditioners	6.6	2.9	5.0
Plug-in Dehumidifiers	16.2	14.9	28.3
Plug-in Humidifiers	20.7	14.7	21.4
Plug-in Space Heaters	8.8	4.8	3.2
Car Block Heaters	37.5	34.7	36.4
Electric Blankets	15.8	11.0	13.6

PLANNED CHANGES IN SPACE HEATING BY PRINCIPAL SPACE HEATING FUEL

	PRINCIPAL SPACE HEATING FUEL		
	OIL	WOOD	ELECTRICITY
CHOICE OF HEATING FUEL FOR NEW HOME	Percent	Percent	Percent
Oil	4.8	0.3	0.2
Wood	6.3	27.4	4.5
Electricity	17.1	2.1	25.9
Propane	2.0	0.5	0.4
Oil/Wood	13.6	12.7	4.3
Oil/Electricity	2.4	-	0.4
Wood/Electricity	25.1	36.3	39.0
Wood/Solar	3.5	7.5	4.0
Electricity/Solar	3.4	0.9	6.2
Other	9.2	5.9	7.1
SWITCH TO NATURAL GAS IF AVAILABLE			
Yes	23.6	9.7	10.7
No	24.3	46.5	40.5
Don't Know	44.5	38.6	43.0

PERCEPTION OF FUEL PRICES BY PRINCIPAL SPACE HEATING FUEL

	PRINCIPAL SPACE HEATING FUEL		
	OIL	WOOD	ELECTRICITY
MOST EXPENSIVE FUEL TODAY	Percent	Percent	Percent
Oil	47.8	51.7	63.1
Electricity	33.5	33.3	22.9
Wood	2.5	3.8	1.5
Propane	2.2	1.6	1.8
LEAST EXPENSIVE FUEL TODAY			
Oil	5.4	0.4	0.8
Electricity	6.7	2.4	16.4
Wood	59.7	84.7	62.9
Propane	7.5	2.0	5.2
MOST EXPENSIVE FUEL 5 YEARS FROM NOW			
Oil	62.2	61.4	67.9
Electricity	17.6	21.9	16.5
Wood	2.1	2.9	1.6
Propane	0.6	0.4	0.4
Natural Gas	-	-	-
LEAST EXPENSIVE FUEL 5 YEARS FROM NOW			
Oil	1.4	0.3	0.8
Electricity	9.7	4.6	15.7
Wood	33.5	61.7	35.3
Propane	2.9	2.1	2.8
Natural Gas	0.0	0.0	0.0

SATURATION LEVEL OF MAJOR ELECTRIC APPLIANCES BY TYPE OF DWELLING

	TYPE OF DWELLING			
	SINGLE FAMILY	DUPLEX	APARTMENT/ FLAT	MOBILE HOME
KITCHEN APPLIANCES	Percent	Percent	Percent	Percent
Electric Range (All Types)	88.2	93.7	96.0	87.1
Refrigerator (Frost Free)	66.0	68.2	35.7	47.6
Refrigerator (Manual defrost)	36.7	34.3	64.9	50.8
Freezer (Frost Free)	9.8	7.7	4.5	6.6
Freezer (Manual Defrost)	53.9	40.0	20.8	39.0
LAUNDRY APPLIANCES				
Automatic Washer	79.6	80.5	30.5	69.0
Other Electrical Washer	16.3	12.7	20.1	20.1
Washer-Dryer (1 unit)	2.3	2.5	3.0	4.3
Electric Dryer	76.4	75.8	27.7	68.6

SATURATION LEVEL OF HEATING FUELS BY TYPE OF DWELLING

	TYPE OF DWELLING			
	SINGLE FAMILY	DUPLEX	APARTMENT/ FLAT	MOBILE HOME
PRINCIPAL SPACE HEATING FUEL	Percent	Percent	Percent	Percent
Oil	53.2	76.2	49.6	73.3
Wood	23.0	6.7	1.7	8.6
Electricity	23.4	16.4	42.5	17.2
Other or Don't Know	0.4	0.7	6.2	0.9
SUPPLEMENTARY SPACE HEATING FUEL				
Oil	9.4	4.4	2.0	6.4
Wood	28.8	9.8	2.1	13.2
Electricity	10.8	8.3	6.1	6.2
Other	1.1	0.1	0.3	4.1
None	13.8	26.3	32.1	25.8
WATER HEATING FUEL				
Oil	27.5	39.3	36.9	4.4
Propane	2.6	2.3	1.0	0.9
Electricity	65.8	56.7	57.5	93.3
Other or None	4.1	1.7	4.5	1.4

SATURATION LEVEL OF OTHER ELECTRIC APPLIANCES BY TYPE OF DWELLING

	TYPE OF DWELLING			
	SINGLE FAMILY	DUPLEX	APARTMENT/ FLAT	MOBILE HOME
	Percent	Percent	Percent	Percent
ELECTRICAL APPLIANCES				
Central Air-Conditioning	0.9	0.7	0.4	3.0
Automatic Dishwasher	30.6	29.4	8.2	8.0
Toaster Oven	24.9	25.6	21.5	22.0
Microwave Oven	7.0	8.2	2.3	3.3
Colour TV's	83.0	83.7	66.8	74.1
B & W TV's	41.1	40.4	40.5	39.7
Hi-Fi or Stereo System	68.0	70.5	65.1	70.8
Window Air-Conditioners	5.2	6.8	5.1	8.0
Plug-in Dehumidifiers	21.7	13.3	4.0	2.3
Plug-in Humidifiers	20.0	22.3	13.5	15.0
Plug-in Space Heaters	6.8	8.9	4.3	5.8
Car Block Heaters	37.8	39.7	21.7	38.3
Electric Blankets	15.0	16.7	9.4	8.0

SATURATION LEVEL OF OTHER ELECTRIC APPLIANCES BY PLACE OF RESIDENCE

	PLACE OF RESIDENCE		
	CITY	TOWN	RURAL
KITCHEN APPLIANCES	Percent	Percent	Percent
Electric Range	78.6	92.5	85.2
Refrigerator (Frost Free)	55.9	69.3	58.0
Refrigerator (Manual Defrost)	32.6	35.3	40.3
Freezer (Frost Free)	6.6	9.9	9.9
Freezer (Manual Defrost)	38.2	45.2	52.0
LAUNDRY APPLIANCES			
Automatic Washer	61.9	80.7	73.2
Other Electrical Washer	9.8	10.8	21.0
Washer-Dryer (1 unit)	1.7	2.1	2.8
Electric Dryer	57.7	75.1	71.6

SATURATION LEVEL OF HEATING FUELS
BY PLACE OF RESIDENCE

	PLACE OF RESIDENCE		
	CITY	TOWN	RURAL
PRINCIPAL SPACE HEATING FUEL	Percent	Percent	Percent
Oil	68.6	63.3	46.4
Wood	6.9	8.9	30.1
Electricity	22.6	27.2	23.2
Other or Don't Know	1.9	0.6	0.4
SUPPLEMENTARY SPACE HEATING FUEL			
Oil	3.5	5.3	11.7
Wood	12.6	21.9	29.5
Electricity	7.2	9.3	10.7
Other	1.2	1.1	0.9
None	17.6	20.9	12.3
WATER HEATING FUEL			
Oil	42.8	30.0	20.0
Propane	1.8	1.4	2.9
Electricity	53.7	66.4	71.4
Other or None	1.7	2.2	5.8

SATURATION LEVEL OF OTHER ELECTRIC APPLIANCES BY PLACE OF RESIDENCE

ELECTRICAL APPLIANCES	PLACE OF RESIDENCE		
	CITY	TOWN	RURAL
	Percent	Percent	Percent
Central Air-Conditioning	0.5	1.4	0.9
Automatic Dishwasher	25.2	31.7	23.5
Toaster Oven	22.6	28.0	21.7
Microwave Oven	5.2	8.3	5.5
Colour TV's	70.2	85.7	78.0
B & W TV's	33.2	39.9	40.8
Hi-Fi or Stereo System	59.7	69.9	64.7
Window Air-Conditioners	7.2	5.9	3.8
Plug-in Dehumidifiers	20.1	20.9	14.5
Plug-in Humidifiers	18.8	23.0	16.1
Plug-in Space Heaters	6.7	6.9	5.7
Car Block Heaters	36.9	36.8	33.1
Electric Blankets	12.8	15.6	12.1

SATURATION LEVEL OF MAJOR ELECTRIC APPLIANCES BY TENURE

	TENURE	
	OWN	RENT
KITCHEN APPLIANCES	Percent	Percent
Electric Range	88.5	93.5
Refrigerator (Frost Free)	65.3	45.8
Refrigerator (Manual Defrost)	37.1	54.9
Freezer (Frost Free)	9.6	6.2
Freezer (Manual Defrost)	53.4	26.8
LAUNDRY APPLIANCES		
Automatic Washer	79.8	47.1
Other Electrical Washer	16.0	20.8
Washer-Dryer	2.3	3.8
Electric Dryer	76.7	44.4

SATURATION LEVEL OF HEATING FUELS
BY TENURE

	OWN	RENT
PRINCIPAL SPACE HEATING FUEL	Percent	Percent
Oil	54.1	64.1
Wood	22.0	4.3
Electricity	23.4	27.5
Other or don't know	0.4	4.1
SUPPLEMENTARY SPACE HEATING FUEL		
Oil	9.1	3.9
Wood	27.9	5.5
Electricity	10.8	5.8
Other	1.2	0.5
None	14.2	32.6
WATER HEATING FUEL		
Oil	27.0	30.4
Propane	2.4	1.6
Electricity	66.8	63.7
Other or None	3.8	4.3

SATURATION LEVEL OF OTHER ELECTRIC APPLIANCES BY TENURE

ELECTRICAL APPLIANCES	OWN Percent	RENT Percent
Central Air-Conditioning	1.0	0.5
Automatic Dishwasher	29.1	13.1
Toaster Oven	24.9	22.5
Microwave Oven	6.9	3.6
Colour TV'S	83.3	68.4
B.W. TV'S	40.5	44.1
Hi-Fi or Stereo System	67.9	70.4
Window Air-Conditioners	5.5	5.9
Plug-in Dehumidifiers	20.8	6.0
Plug-in Humidifiers	20.5	12.9
Plug-in Space Heaters	6.9	5.2
Car Block Heaters	38.0	27.5
Electric Blankets	14.8	10.8

APPLIANCE SATURATION LEVELS BY
ANNUAL CONSUMPTION (KWH) BLOCKS

ELECTRICAL APPLIANCE	0-5000	5,000-10,000	10,000-25,000	15,001-20,000	20,001-25,000	OVER 25,000
Cooking Range	66.9	89.8	94.3	96.3	97.7	97.1
Refrigerator Freezer	49.3	64.9	67.8	72.5	75.7	77.0
Other Refrigerator	53.4	40.8	39.3	33.2	31.5	35.3
Home Food Freezer	46.3	65.2	73.1	69.5	68.2	66.6
Dishwasher	8.6	21.4	34.4	36.5	44.4	55.3
Clothes Washer (automatic)	44.8	76.7	85.8	88.8	89.9	93.6
Clothes Washer (Wringer Type)	37.3	18.2	11.4	8.3	7.1	5.7
Clothes Dryer	40.4	74.2	84.3	86.7	86.1	89.7
Water Heating Equipment	27.4	50.3	77.2	85.5	91.1	90.1
Space Heating Equipment	4.0	5.2	16.1	47.5	69.8	80.4

APPLIANCE SATURATION LEVELS BY
ANNUAL CONSUMPTION (KWH) BLOCKS

ELECTRICAL APPLIANCE	0-5,000	5001-10,000	10,001-15,000	15,001-20,000	20,001-25,000	OVER 25,000
Toaster Oven	23.5	25.7	21.6	22.6	27.7	25.8
Microwave Oven	3.1	5.9	6.5	8.0	8.7	10.7
Color T.V.	64.9	82.8	85.8	90.1	88.5	92.0
B & W T.V.	41.1	38.8	40.4	39.0	39.3	42.5
Hi Fi or Stereo	46.0	65.6	74.2	74.2	76.3	79.4
Plug-In Dehumidifer	7.7	15.9	20.5	30.6	30.4	32.3
Plug-In Humidifer	15.0	19.7	19.1	21.8	19.9	28.3
Car Block Heater	29.0	38.5	40.7	39.2	37.7	37.8
Electric Blanket	14.5	15.1	13.8	13.4	12.7	14.0
Window Air Conditioner	4.5	6.6	6.3	6.2	8.2	7.8

CONSUMPTION CHARACTERISTICS

SECTION IV

KWH CONSUMPTION[1] OF HOMES WITH ELECTRIC SPACE HEATING
ELECTRIC WATER HEATING AND NO SUPPLEMENTARY HEATING

	SINGLE FAMILY	DUPLEX	APARTMENTS	MOBILE HOMES	ALL TYPES COMBINED
JANUARY	3758	3250	1722	2998	3531
FEBRUARY	3480	3043	1578	3271	3299
MARCH	3179	3078	1540	2484	3007
APRIL	2398	2034	1026	1882	2244
MAY	1841	1541	771	1379	1716
JUNE	1178	1091	507	830	1102
JULY	946	863	504	650	890
AUGUST	846	816	447	580	798
SEPTEMBER	883	903	498	636	840
OCTOBER	1512	1337	719	1232	1426
NOVEMBER	2041	1771	935	1675	1921
DECEMBER	2586	2146	1179	2080	2425
YEAR TOTAL	24,648	21,873	11,426	19,697	23,199

(1) Based on consumption data for 1981 and not adjusted for varying weather conditions.

KWH CONSUMPTION[1] OF HOMES WITH ELECTRIC SPACE HEATING
WOOD SUPPLEMENTARY HEATING AND ELECTRIC WATER HEATING

	SINGLE FAMILY	DUPLEX	APARTMENTS	MOBILE HOMES
JANUARY	2713	*	*	*
FEBRUARY	2547	*	*	*
MARCH	2257	*	*	*
APRIL	1930	*	*	*
MAY	1583	*	*	*
JUNE	1095	*	*	*
JULY	1011	*	*	*
AUGUST	904	*	*	*
SEPTEMBER	885	*	*	*
OCTOBER	1285	*	*	*
NOVEMBER	1528	*	*	*
DECEMBER	1703	*	*	*
YEAR TOTAL	19,441	*	*	*

* Data considered unreliable due to insufficient sample size.

(1) Based on consumption data for 1981 and not adjusted for varying weather conditions.

KWH CONSUMPTION[1] OF HOMES WITH NON-ELECTRIC SPACE HEATING
NON ELECTRIC SUPPLEMENTARY HEATING AND ELECTRIC WATER HEATING

	SINGLE FAMILY	DUPLEX	APARTMENTS	MOBILE HOMES
JANUARY	1112	1099	712	992
FEBRUARY	1019	980	656	926
MARCH	1079	1010	750	924
APRIL	899	858	590	789
MAY	826	809	555	722
JUNE	740	725	506	619
JULY	789	786	528	642
AUGUST	754	711	465	588
SEPTEMBER	717	664	467	578
OCTOBER	823	758	588	702
NOVEMBER	834	790	559	739
DECEMBER	858	775	600	744
YEAR TOTAL	10,450	9,965	6,976	8,965

(1) Based on consumption data for 1981 and not adjusted for varying weather conditions.

KWH CONSUMPTION[1] OF HOMES WITH NON-ELECTRIC SPACE HEATING NON-ELECTRIC SUPPLEMENTARY HEATING AND NON-ELECTRIC WATER HEATING

	SINGLE FAMILY	DUPLEX	APARTMENTS	MOBILE HOMES
JANUARY	828	726	393	*
FEBRUARY	769	727	380	*
MARCH	789	743	417	*
APRIL	598	602	331	*
MAY	542	550	298	*
JUNE	503	524	296	*
JULY	542	495	286	*
AUGUST	534	470	288	*
SEPTEMBER	505	456	284	*
OCTOBER	587	531	346	*
NOVEMBER	603	574	362	*
DECEMBER	611	613	349	*
YEAR TOTAL	7,411	7,011	4,030	*

* Data considered unreliable due to insufficient sample size.

(1) Based on consumption data for 1981 and not adjusted for varying weather conditions.

APPENDICES

SECTION V

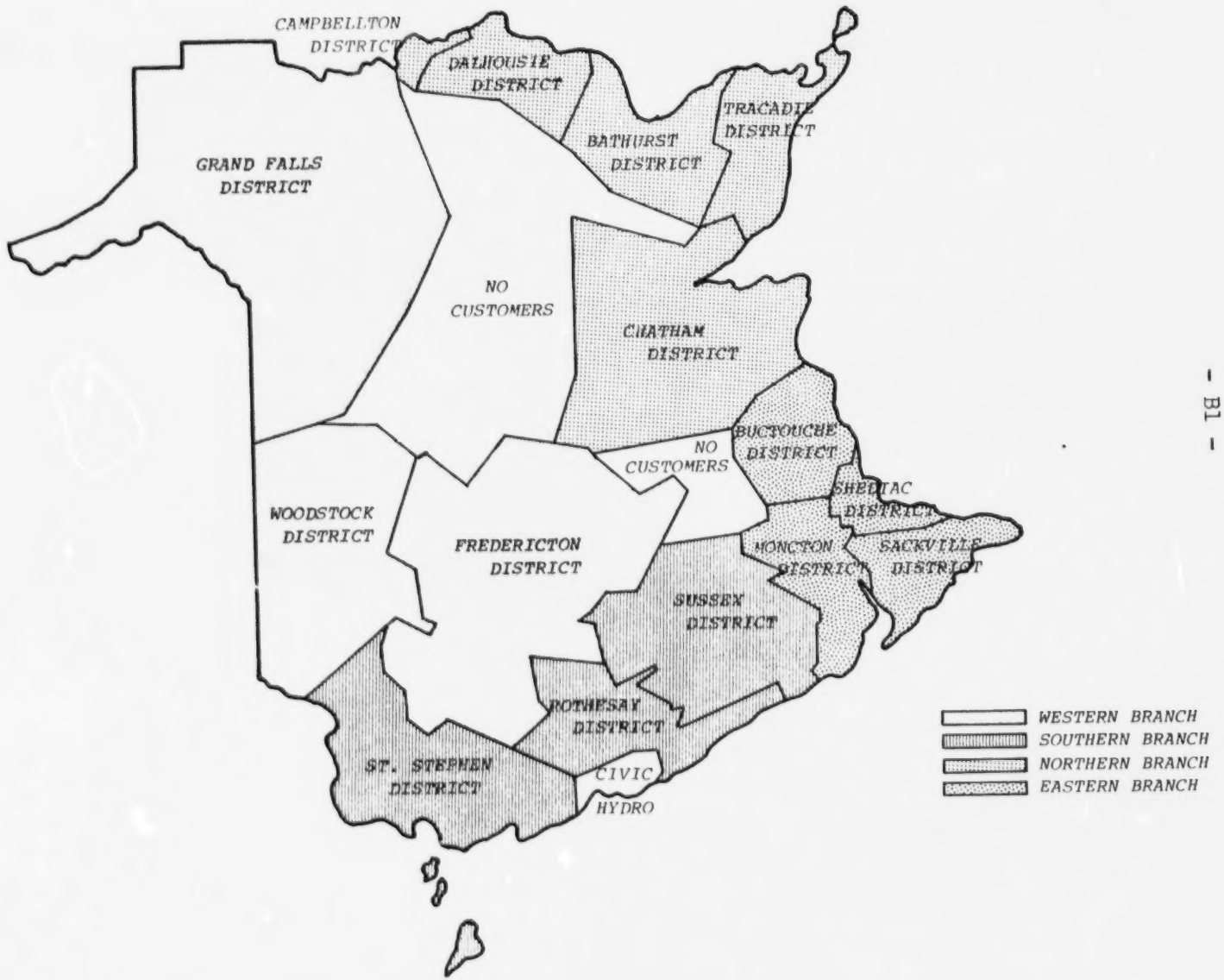
APPENDIX A

SAMPLE AND RESPONSE

REGION

	NORTHERN BRANCH	EASTERN BRANCH	SOUTHERN BRANCH	WESTERN BRANCH	NB POWER TOTAL
Total NB Power Residential Accounts as of Sept 30/81	53,137	54,764	37,010	61,857	206,768
Number of Customers* selected in the Sample	5,433	5,399	3,489	6,432	20,753
Sample as a Percentage of Total Accounts	10.2	9.9	9.4	10.4	10.0
No. of Processable Responses Received	1,784	2,158	1,329	2,341	7612
Responses as a Percent of the sample	32.8	40.0	38.1	36.4	36.7
Responses as a percent of Total Residential Accounts	3.4	3.9	3.6	3.8	3.7

* Questionnaires were not mailed to the non residential customers selected in the sample. e.g. Churches, Charitable Organization. Actual number of questionaires mailed was very close to 20,000.


CAMPBELLTON DISTRICT
DALHOUSIE DISTRICT
TRACADIE DISTRICT
BATHURST DISTRICT
GRAND FALLS DISTRICT
NO CUSTOMERS
CHATHAM DISTRICT
BUCTOUCHE DISTRICT
NO CUSTOMERS
SHEDIAC DISTRICT
WOODSTOCK DISTRICT
FREDERICTON DISTRICT
MONCTON DISTRICT
SACKVILLE DISTRICT
SUSSEX DISTRICT
ROTHESAY DISTRICT
ST. STEPHEN DISTRICT
CIVIC HYDRO
WESTERN BRANCH
SOUTHERN BRANCH
NORTHERN BRANCH
EASTERN BRANCH

appliance saturation survey

[illegible]

[illegible] questionnaire. Your co-operation in answering the questions will help us plan for your future electrical needs. [illegible] Your co-operation in answering the questions

Upon completion please return the questionnaire in the enclosed envelope. No stamp or signature is required.

Please do it now, while you are thinking about it.

Thank you for your co-operation.

Sincerely,

ENERGIE NB POWER

11593

APPENDIX C

Please check ☑ the appropriate boxes.

I YOUR KITCHEN:

20 Cooking (check main one only)

1 electric range (continuous clean)
2 electric range (self clean)
3 electric range (no built in cleaning feature)
4 oil range
5 gas range
6 wood range
7 other _____

Refrigeration:

21 2 or 3 door combination refrigerator-freezer.

22 Is it frost free?
A Yes B No

23 Other electric refrigerator.

Is it frost free?
24 A Yes B No

25 Separate home food freezer

Is it frost free?
26 A Yes B No

II YOUR LAUNDRY:

(Do not include coin-operated or any other laundry equipment used outside your home).

27 automatic washer
28 other electric washer (wringer, spin dry etc.)
29 combination washer/dryer (one unit)
30 electric clothes dryer
31 gas clothes dryer

III YOUR HEATING SYSTEM:

32 Principal space heating fuel?
(check main one only)

1 oil 2 wood
3 electricity 4 other
5 don't know

33 [illegible]
(check one)

A oil B wood
C electricity D other
E none

34 Type of heating system if principal or supplementary heating fuel is electricity? (check one)

1 baseboard
2 electric furnace
3 radiant cable
4 heat pump
5 plug in heaters
6 other _____

35 Water heating fuel?
(check one)

1 oil 2 propane
3 electricity 4 other
5 none

36 [illegible]

IV OTHER ELECTRIC APPLIANCES:

		No. in use
37	central air-conditioning	
38	automatic dishwasher	
39	toaster oven	
40	microwave oven	
41	colour TV's	_____
42	B & W TV's	_____
43	hi-fi or stereo systems	_____
44	window air conditioners	_____
45	plug-in dehumidifiers	_____
46	plug-in humidifiers	_____
47	plug-in space heaters	_____
48	car block heaters	_____
49	electric blankets	_____

V YOUR HOME:

50 [illegible]

1 single family house 2 duplex
3 apartment/flat 4 mobile home

51 [illegible]

A own B rent your home

52 [illegible]

53 [illegible]

C1

1	before 1956	2	1956-60
3	1961-65	4	1966-70
5	1971-75	6	1976-80
7	1981	8	don't know

1	0-5 years	2	6-10 years
3	11-15 years	4	over 15 years
5	don't know		

A	no
B	yes within 1 year
C	yes within 5 years
D	don't know

1	no plans to change
2	electricity
3	oil
4	wood
5	natural gas
6	solar
7	other (specify) _____

A	federal government grant for conversion
B	need to replace heating system
C	cost
D	convenience
E	comfort
F	other _____

added insulation in your home?
added solar heating equipment?
changed your method of space heating? from:

	oil	B	electric
	wood	D	other _____

VI GENERAL:

A	oil	B	wood
C	electricity	D	propane
E	solar	F	other _____

APPENDIX C

66 Type of heating system do you have in your home?

1	baseboard	2	elec. furnace
3	radiant cable	4	heat pump
5	plug in heaters	6	other _____

67 Would you switch from your present heating fuel to natural gas if it is available in your area?

A ( ) Yes B ( ) no C ( ) don't know

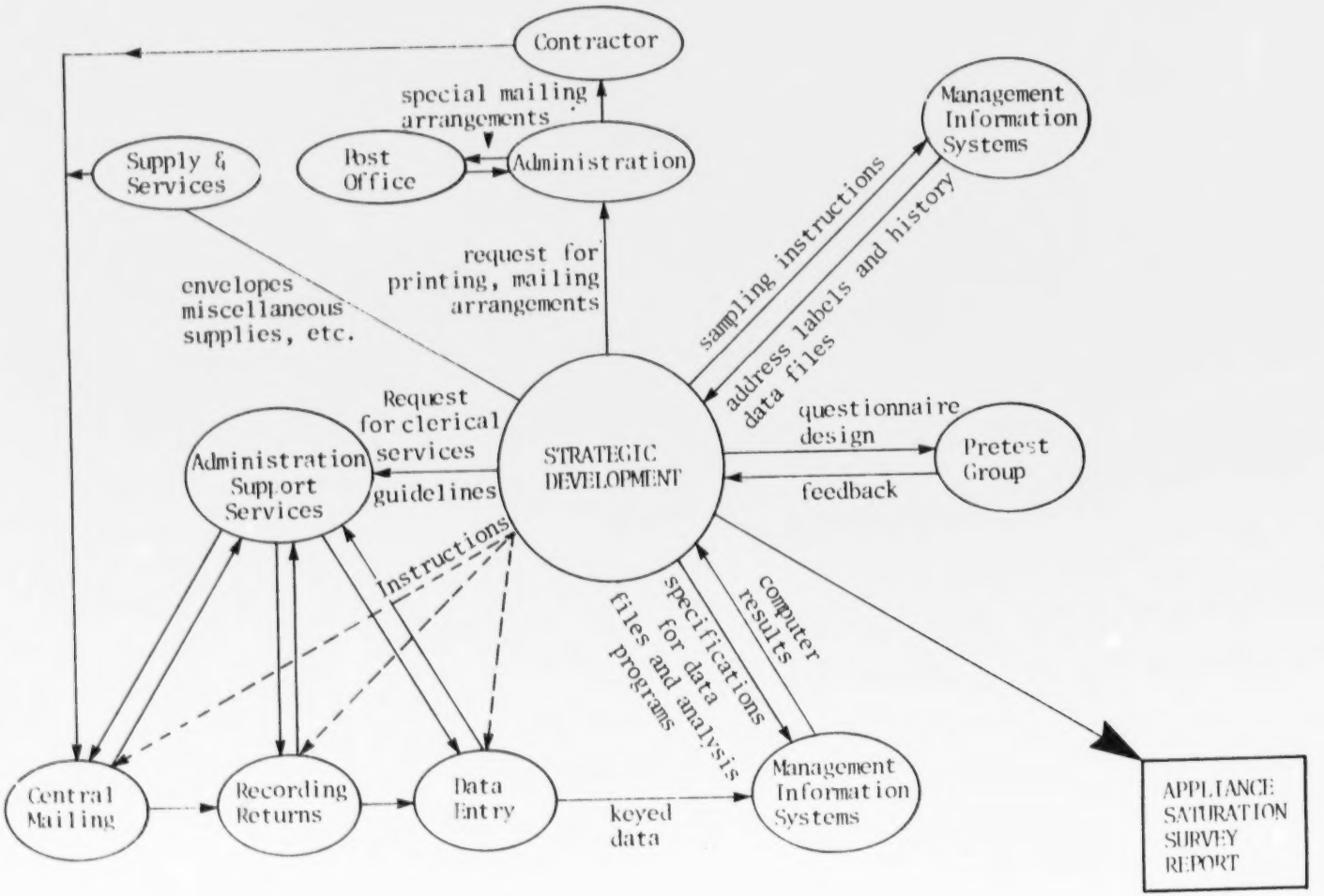
68 In your opinion which is the most expensive fuel and least expensive heating fuel available to Nova Scotia consumers at present?

	most expensive (check one)	least expensive (check one)
oil	A ( )	A ( )
electricity	B ( )	B ( )
wood	C ( )	C ( )
propane	D ( )	D ( )

70 Which fuel do you think will be most expensive least expensive five years from now?

	most expensive (check one)	least expensive (check one)
oil	A ( )	B ( )
electricity	B ( )	B ( )
wood	C ( )	C ( )
propane	D ( )	D ( )
natural gas	E ( )	E ( )

APPENDIX D



APPLIANCE SATURATION SURVEY WORKFLOW